

Long-term planning (LTPs) - Planning how the key concepts, knowledge, skills identified in the Progression map will be delivered termly per year group

Ensuring that end points & NC/spec are covered

Identifying what assessments are planned and when

Allowing for whole academy intent priorities to be planned for

Autumn 1						
Unit title:	Rates	Organising an ecosystem	Biodiversity and ecosystems	Wave properties	EM Waves	Electromagnetism
Unit length:	10 lessons	3 lessons	6 lessons	3 lessons	5 lessons	3 lessons
Key concepts:	Reaction rate is affected by 4 variables Only temperature changes the energy of a particle	All living things are interdependent Nutrients cycle through the environment When (due to demand) a resource becomes non-renewable it means the rate of cycling is lower than the rate of use	Humans and their rising populations have an impact upon biodiversity The impact of humans taking the resources they need have long term implications which must be managed	Waves have definable properties There are 2 wave types, longitudinal and transverse, each having specific characteristics	Light is part of a broader spectrum which is subdivided based on wavelengths The properties of EM depend on wavelength and give rise to their uses and hazards	Electromagnetism can be the result of moving charge. Magnetism is a non contact force Electromagnetic fields can be manipulated and be used to do work.
Knowledge/ Skills:	Key How to apply the particle model to the collision theory used in explaining the rate effects of changing the conditions of a reaction To explain how catalysts change the rate of reaction in terms of activation energy and reaction profiles Core The properties of the different states of matter, in terms of the particle model (and gas pressure) What a catalyst does Simple methods for separating mixtures Some examples of combustion and thermal decomposition reactions	Key The links between adaptation, competition and survival in a range of environments That resources are finite and in short supply That resources cycle through environments Core Individual animals and plants needing different resources from the environment Darwin's theory "survival of the fittest" Plants need the reactants of photosynthesis and mineral ions Organisms are adapted to compete in their environments How organisms reproduce	Key How to estimate biodiversity and population size The links between adaptation, competition, and survival in a range of environments That resources are finite and in short supply That resources cycle through environments That decomposition is an important factor in the survival of organisms The maintenance of food security Core Individual animals and plants needing different resources from the environment	Key How wave speed wavelength and frequency are related to each other How to measure sound wave speed in air and in a solid How the electromagnetic spectrum can carry information and images Refraction being the change in direction a wave takes as it goes from one transparent/translucent medium of one density to another, this change in direction being due to a change in speed) Core The top of a wave is the crest and the bottom is a trough	Key How wave speed wavelength and frequency are related to each other How to measure sound wave speed in air and in a solid How the electromagnetic spectrum can carry information and images Refraction being the change in direction a wave takes as it goes from one transparent/translucent medium of one density to another, this change in direction being due to a change in speed) Core The top of a wave is the crest and the bottom is a trough	Key How magnetic fields are produced and how to produce a string electromagnet How to display and record magnetic fields How magnetic fields are used in real life situations Core Magnetism is a non contact force and produces a field Magnetic field lined enter magnets through the south pole and leave the north Powerful Chemistry – similarities to electrostatics

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	<p>The structure of some simple molecular substances</p> <p>Powerful</p> <p>Rates of respiration and photosynthesis on biology</p> <p>Particle and collision theory and energy changes</p> <p>The understanding that different elements interact in predictable ways to form compounds. Appreciating that they do this in predictable ways, with predictable energy, "amounts" and rates of reaction</p>	<p>Powerful</p> <p>Biotic and abiotic factors many other sections in biology</p> <p>Links to aspects of energy resources in physics</p> <p>Links to aspects of the earths early atmosphere and resources topics</p>	<p>Darwin's theory "survival of the fittest"</p> <p>Plants need the reactants of photosynthesis and mineral ions</p> <p>Organisms are adapted to compete in their environments</p> <p>How organisms reproduce</p> <p>Powerful</p> <p>Biology – reproduction and genetics</p>	<p>Light waves are much faster than sound waves and can also travel through a vacuum</p> <p>The light spectrum is continuous and shifts across ROYGBIV</p> <p>There are different kinds of waves but they have properties such as refraction in common</p> <p>Powerful</p> <p>Chemistry – Chemical analysis</p> <p>Physics – energy transfers, waves</p>	<p>Light waves are much faster than sound waves and can also travel through a vacuum</p> <p>The light spectrum is continuous and shifts across ROYGBIV</p> <p>There are different kinds of wave but they have properties such as refraction in common</p> <p>Powerful</p> <p>Biology – the eye and receptors in the nervous system</p> <p>Chemistry – global warming</p>	
End points covered:	<p>The understanding that different elements interact in predictable ways to form compounds. Appreciating that they do this in predictable ways, with predictable energy, "amounts" and rates of reaction</p>	<p>Understanding of how organisms interact with each other and with their environment</p>	<p>Understanding of how organisms interact with each other and with their environment</p>	<p>Understanding that energy can be transferred through media in the form of waves, with no net transfer of matter. Waves can interact with matter and with one another in a multitude of ways with predictable, if unintuitive, outcomes.</p>	<p>Understanding that energy can be transferred through media in the form of waves, with no net transfer of matter. Waves can interact with matter and with one another in a multitude of ways with predictable, if unintuitive, outcomes.</p> <p>Understanding that the atoms that contribute to particle theory are themselves composed of even smaller particles. The compositions and arrangements of these smaller particles dictates the chemical properties of substances, and changing these can lead to drastic and unexpected energy changes.</p>	<p>Understanding that magnetic fields can be set up and used for different purposes</p> <p>Understand that these waves interact with matter</p>
NC/Spec coverage:	<p>6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.7</p>	<p>7.2.1, 7.2.2, 7.2.2, 7.2.3</p>	<p>7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.3.6, 7.2.4 , 7.4.1,</p>	<p>6.1.1 6.1.2, 6.2.1, 6.2.2, 5.6.1.2, 6.1.2, 6.1.4, 6.1.5</p>	<p>6.1.2, 6.2.1, 6.2.2, 6.2.3, 6.2.4</p>	<p>7.1.1, 7.1.2 , 7.2.1, 7.2.2, 7.2.3, 5.1.2</p>

			7.4.2, 7.4.3, 7.5.1, 7.5.2, 7.5.3, 7.5.4			
Cross-curricular links:	Some DT links	Maths Physical and human geography	Geography Maths	Photography	Photography	DT
Assessments:						
<i>Other academy intent priorities</i>						
Curriculum Careers - Gatsby 4	Chemist, research chemist, forensic scientist, pharmacist, metallurgist, materials scientist, vet, electricity generation engineer	Ecologist, zoologist, palaeontologist, geologist, botanist, zookeeper, geophysicist, petroleum scientist, conservationist, planning officer	Ecologist, zoologist, palaeontologist, botanist, zookeeper, conservationism, planning officer, zoologist, palaeobiologist	Engineer, mechanic, sports scientist, materials scientist, photographer, cinematographer, physical geographer, surveyor, architect, seismologist, forensic scientist, artist	Engineer, mechanic, sports scientist, materials scientist, photographer, cinematographer, physical geographer, surveyor, architect, seismologist, forensic scientist, artist.	Engineer, electrician, EV developer
Culturally rich – broadening horizons	Opportunities to: <ul style="list-style-type: none"> - Discuss changing ideas over time and cooperation between scientists 	Opportunities to: <ul style="list-style-type: none"> - Discussion of natural resources in different countries linked to the adaptations of their flora and fauna for their individual niches 	Opportunities to: <ul style="list-style-type: none"> - Discuss the indigenous flora and fauna of different countries as examples 	Opportunities to: <ul style="list-style-type: none"> - Discuss amplitude and wavelength in terms of Hawaiian surfing waves (stress tht “water” waves mustn’t be used as examples of a transverse wave). 	Opportunities to: <ul style="list-style-type: none"> - Discuss changing ideas over time and cooperation between scientists - Discussion of the reasons for differing amounts of melanin in different countries 	Opportunities to: <ul style="list-style-type: none"> - Discuss the use of electromagnets in EV’s and link this to global warming / climate change and the availability of scarce resources (hydrocarbons and for the batteries themselves)

Autumn 2						
Unit title:	The Earth’s resources	Forces and motion				
Unit length:	6 lessons	5 lessons				
Key concepts:	The earth contains resources that are needed to sustain populations Many resources are finite How resources can be maximised	Motion is a factor of force and resistance Forces interact and so influence speed and direction of movement				

<p>Knowledge/ Skills:</p>	<p>Key A wider range of chemical tests to identify unknown substances/ions and how technology can be used How the atmosphere developed to the composition that it has today How climate change is caused by increases in the levels of greenhouse gases and how this can be addressed How to analyse data on finite resources, including the use of orders of magnitude Carry out LCA's to determine the impact of making new materials</p> <p>Core About the difference between pure substances and mixtures and how some can be identified The composition of the atmosphere That carbon dioxide is released by human activities and the impact of this upon climate How the earths resources are finite and the importance of recycling Some of the properties of composite polymers and ceramics How carbon can be used to extract some metals</p> <p>Powerful</p>	<p>Key Forces are measured in Newtons with a Newtonmeter An object is in equilibrium when the forces acting on it are in balance The unit of speed is m/s Drag and frictional forces resist the movement of moving objects Whenever objects interact they exert forces on each other That the weight of an object depends upon the gravitational force exerted upon its mass</p> <p>Core The differences between vector and scalar quantities and how these can be represented How calculate resultant force and know how to resolve a force into its perpendicular components The different between speed and velocity and can explain acceleration An understanding of terminal velocity and why falling objects in gases and liquids/solutions reach it An understanding of elasticity and how to measure the stiffness of a spring How to calculate weight from given masses and gravitational field strengths</p> <p>Powerful</p>				
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	Chemistry – natural resources, metal extraction, greenhouse effect/global warming etc Biology – resources (biotic and abiotic)	Links to forces and motion units in physics				
End points covered:	Appreciate that the evolution of the Earth’s atmosphere has been and remains an ongoing due to a number of processes which provide resources we use today	Understanding of how all interactions in the Universe are reliant on forces being exchanged between two or more bodies, and that these force interactions are inextricable from the corresponding energy and momentum conservation within systems				
NC/Spec coverage:	8.2.1, 8.2.2, 8.2.3, 8.2.4, 10.1.1, 10.1.2, 10.1.4, 10.2.1	5.6.2.1, 5.6.2.2, 5.1.3, 5.6.3.1, 5.6.3.2, 5.6.3.3, 5.6.3.4, 5.7.1, 5.7.2, 5.7.3				
Cross-curricular links:	Geography	Sports science Kinetic theory in chemistry Resistance / drag in biology DT				
Assessments:						
<i>Other academy intent priorities</i>						
Curriculum Careers - Gatsby 4	Chemist, research chemist, forensic scientist, pharmacist, metallurgist, materials scientist, vet, electricity generation engineer, motor engineer, petroleum scientist, mining engineers, geologists, botanists, palaeobotanists, palaeontology, environmentalist, recycler	Engineer, mechanic, sports scientist, safety tester, materials scientist, sedimentologist, physical geographer, surveyor, architect				
Culturally rich – broadening horizons	Opportunities to: <ul style="list-style-type: none"> - Discussion of the resources in different countries 	Opportunities to: <ul style="list-style-type: none"> - Discuss changing ideas over time and cooperation between scientists 				

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	- Can be linked to issues of exploitation and or formation of areas of cultural heritage	- Discussion linked to forces during cultural events, e.g. caber toss, husafell stone etc.				
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Spring 1						
Unit title:	Adaptation, interdependence and competition					
Unit length:	8 lessons					
Key concepts:	All organisms rely on each other for a range of biotic and abiotic factors All organisms have evolved through natural selection, gaining adaptations which increase their chances of survival Species compete with each other (and between themselves) for resources					
Knowledge/ Skills:	Key How to estimate biodiversity and population size The links between adaptation, competition and survival in a range of environments That resources are finite and in short supply That resources cycle through environments That decomposition is an important factor in the survival of organisms Core					

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	<p>Individual animals and plants needing different resources from the environment</p> <p>Darwin's theory "survival of the fittest"</p> <p>Plants need the reactants of photosynthesis and mineral ions</p> <p>Organisms are adapted to compete in their environments</p> <p>How organisms reproduce</p> <p>Powerful</p> <p>Links to Photosynthesis and other Biology units</p> <p>Links to energy transfers (physics)</p>					
End points covered:	Understanding of how organisms interact with each other and with their environment					
NC/Spec coverage:	7.1.1, 7.1.2, 7.1.3, 7.2.1, 7.1.4					
Cross-curricular links:	Geography Maths					
Assessments:						
<i>Other academy intent priorities</i>						
Curriculum Careers - Gatsby 4	Ecologist, zoologist, palaeontologist, botanist, zookeeper, conservationism, planning officer					
Culturally rich – broadening horizons	Opportunities to: Discuss of natural resources in different countries linked to the					

	adaptations of their flora and fauna					
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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Unit title:						
Unit length:						
Key concepts:						
Knowledge/ Skills:						
End points covered:						
NC/Spec coverage:						
Cross-curricular links:						
Assessments:						
<i>Other academy intent priorities</i>						
Curriculum Careers - Gatsby 4						
Culturally rich – broadening horizons						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Unit title:						
Unit length:						
Key concepts:						

Knowledge/ Skills:						
End points covered:						
NC/Spec coverage:						
Cross-curricular links:						
Assessments:						
<i>Other academy intent priorities</i>						
Curriculum Careers - Gatsby 4						
Culturally rich – broadening horizons						